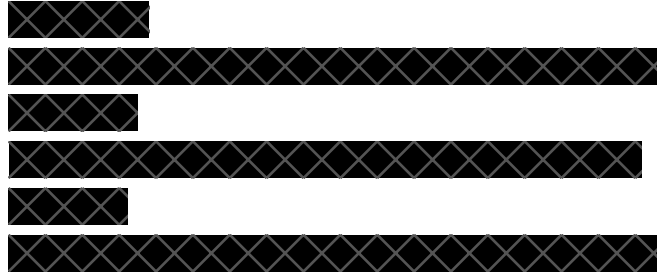


“LifeSync” – A Wellness-Based Scheduling Application

The final report on our group project on LifeSync - an application that not only allows an individual to schedule their weeks, but ensures they are incorporating aspects of wellbeing into it.

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Prototype Overview:

<https://www.figma.com/proto/fk1yNKMBcWgSmYZR4HBy6t/LifeSync?type=design&t=WqcuueYes1wiYT3x-l&scaling=scale-down&page-id=0%3A1&node-id=2-4&starting-point-node-id=2%3A4&mode=design>

1. ABSTRACT

We present LifeSync, an automated wellness based scheduling application that is powered by large language models to generate schedules incorporating user preference for their activity, wellness and work related tasks thereby reducing cognitive load on the user. It also allows you to reflect on the tasks that you have completed and/or tweak your schedule on the basis of your reflection to maximize your daily output.

2. INTRODUCTION

2.1 Problem area and Motivation

Scheduling your day is a great way to keep your tasks in line and complete them on time. While we do schedule our work, we often neglect our fitness and wellness in the process. Trying to find a spot in the day to fit your activities is quite tedious and the act of manually scheduling itself has been proven by our user research to be time consuming. As students and business professionals ourselves, we feel that this problem space is something we experience and observe around us. Health and well-being is very important especially for people of our age and busy schedules should not take away from our ability to care for our health.

2.2 Existing Applications

Skedpal - *facilitate the scheduling of tasks for the day*

The application is targeted to intelligent scheduling of tasks only, it is not able to suggest to the user how they can take care of their wellbeing in the tasks. Additionally, the application is not able to suggest appropriate wellness activities nor is it able to schedule wellness activities such that it helps the user reach a mental or physical wellness goal.

Happify - *adapt to new wellness activities*

The pain point of using the application is that the users are reliant on the application to get the different tasks that they should do in order to take care of their mental wellbeing. The users are suggested tasks, there is no automated way for the users to sync these suggested tasks to their day's calendar.

2.3 Approach deep dive

The current challenges with existing applications is the missing solution to make applications that address the need of the user to focus on taking care of their wellbeing while also being able to complete their day's tasks both at school (for university students) and at work (for working professionals). Our approach makes use of combining

the existing schedules of the user's day, adding in the wellness activities the user is interested in along with user preferences like time of day, wellness goals they plan to achieve and additional inputs like location data to assist in scheduling tasks with respect to the weather (based on user privacy settings). All this information, along with the capabilities of the LLM help our application – LifeSync to generate three schedules that are given to the user. In order to help the user make an informed choice, our application also supports each of the schedules generated with an “insights icon” - reasoning behind the suggested schedule and deciding if it is helpful. We also enable the user to customize the schedules by enabling the user to edit schedules. In addition, we understand the ever-evolving needs and preferences in a user's life and how their wellness will change with the same. Hence, we have the feature for the user to update their wellness activities, add new goals to their profile. The user can also work around with enabling or disabling the location data in their profile page. In order for the user to keep a track and to not forget about any upcoming task and activity we made use of nudges by the application to remind the user of the upcoming tasks. We also appreciate when a user is on track by sending positive nudges on accomplishing a goal.

2.4 Summary

Our overall methodology consisted primarily of semi-structured interviews and qualitative interface evaluations throughout all phases of user research. After our initial literature review, we understood user needs which were then incorporated into the physical design and tested back on the same users. Our key findings indicated that users love having as much customizability and attention to personal details as possible. They love minimalist designs with many affordances to hint at what the application actually requires of them. Additionally, removing cognitive load off of users when it comes to health and well-being scheduling allows them to focus more on the tasks themselves than when and how to incorporate them. All in all, our contributions to the problem space include providing users with an unparalleled level of customizability and predetermined scheduling that allows them to create their ideal schedule with limited cognitive load. We not only take into account the user's personal preferences but their schedule in order to maximize impact.

3. RELATED WORK

Several studies have shown that working professionals that do some form of mental well-being activity like medication tend to manage their stress better and eventually perform better at work and achieve great results [1]. Adding the element of wellness into our application along with day-to-day work allows us to replicate the results of this research piece.

Also, in the scenario of university student's studies, it indicates when students spend time doing outdoor activities positively correlates to their grades and academic and co-curricular performance [2]. Giving users options of indoor vs outdoor in our application allows for flexibility and caters to a broader user base all while benefiting each user group.

A key indicator relating to the performance of an individual in a work setting is related to the mental and physical well-being of the individual [3]. And this focused our goal to help build a solution to address this for the working and student population.

With the increase in life threatening diseases due to lack of physical well-being [4] and the increased rate of young mortality due to not taking care of mental well-being, it is important to solve this issue and address the same such that it does not impact the professional or work goals and activities for people

4. RESEARCH GOALS

Our primary Research question: How should we build a model that can take the cognitive load of scheduling wellbeing tasks/events off the user to aid in the betterment of their overall health both quantitatively and qualitatively?

Goal: To develop a system that reduces the helps the users to better integrate wellness activities in their existing daily schedules and achieve wellbeing goals (both physical and mental wellbeing). To develop a system that reduces cognitive load on users by seamlessly integrating personalized mental and physical well-being activities into their daily work schedules. This system aims to address the challenges individuals face in allocating time for well-being amidst their professional commitments, thereby promoting a balanced and healthy lifestyle.

5. USER-CENTERED DESIGN PROCESS

In order to study the users preferences on the scheduling application, we conducted user surveys in an interview format. These interviews were conducted in phases – pre design (initial phase), post design phase, schedule feedback phase. The team conducted interviews to find what is the current status within the scheduling space, do people include wellness into their schedules actively and if such an application would be useful to them. These insights would guide us to build the application and also use the users inputs to make personal changes in their schedule. We also wanted to know how comfortable our users were knowing that schedule was being generated by AI and privacy related issues.

5.1 User Research and Initial Design

The initial user research focused on the six W's – who, what, where, when, why and how. It ensured that the questions did not induce bias and it gave the users more open space to share their input in depth. And these questions helped answer the research goals and questions we had. We chose 12 participants from the age of 19 to 27 for our group of user surveys. In understanding the user and the user requirements the demographic of Age 19 to 27 is appropriate as this demographic is either studying (having a fixed schedule) or working (having work schedules). Users in this demographic are busy and tend to not find time in order to take care of their wellness. Additionally, users in this demographic want to work on inculcating wellbeing activities in their day schedules. Hence this demographic is appropriate. The questions were focused on:

- What do you wish to achieve out of a scheduling app (Main Goal)?
- When do you make use of tools in order to schedule your day?
- How do you decide the wellness activities to plan?
- Do you find it tedious to schedule your day manually? Does it make you lack motivation to do so and follow through for the day?
- Do you schedule your wellness activities?
- If you schedule your day, does it include addition of physical activity or wellness into your day?

With all these questions, we realized that existing scheduling applications still require a great level of manual data entering from the user which can be of great cognitive load to the user in addition to their already busy schedule.

Using our ongoing user research, one of our users mentioned the lack of motivation to schedule their day. This idea is close to our research question of the ease of automating the scheduling aspect of the application. They mentioned:

Question: Do you find it tedious to schedule your day manually? Does it make you lack motivation to do so and follow through for the day?

User 1: "Yes, I find it tedious to schedule my day manually, and it can sometimes make me lack motivation to follow through for the day."

This helped us drive our design forward in making the application as automated as possible and remove as many manual aspects from start to finish (data collection to reflection stage) in the application.

We asked our users if they use other scheduling apps and if yes, do they have any ongoing issues with the application. This question is important as it helps us navigate our way to design the application by keeping in mind what the user requires.

Question: If yes, do you have any complaints regarding the application? (Make dynamic changes manually, change schedule daily, unable to decide when to do a certain activity?)

User 1 : "Yes, I sometimes have complaints about the application's inflexibility to make dynamic changes and adapt my schedule daily"

Our participants expressed difficulties with current scheduling applications. The main complaint was getting reminders timely which shows us the importance of notifications or other ways of notifying the user. Another complaint was the app's ability to adapt to the user's schedule. We aim to fix this by automating that process using ChatGPT which can readily create a new schedule depending on the changes you have made or want to make to your routine.

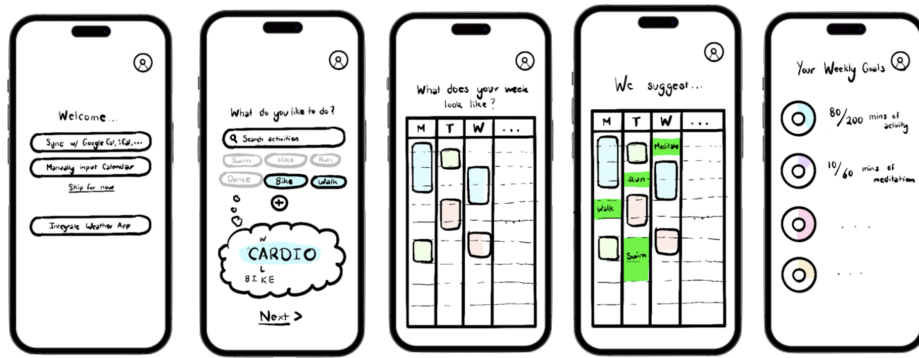


Fig 1. Low fidelity prototype of the application after first round of user surveys

5.2 Final Design

Post our initial user research we built our application to suggest multiple schedules to the user. We added a feature that gives a reason as to why this particular schedule should be picked. Such features proved to be beneficial in assisting the user to make an informed choice. Another component that we added was the Goal Setting page, which was an important data collection point for our application to generate schedules using LLM.

In addition, from our user research we found that most users are unaware of what kind of exercises they can perform. Showing a list of activities in the start allows the user to explore different activities depending on their choice (Indoor or Outdoor). Our users requested the ability to change their schedules manually if required, and that had been incorporated in our application as well. Lastly, the Reflection page shows whether the user has achieved their goals that they set initially and also allows them to change those goals.

To make the user experience more authentic, we built an interactive interface on Figma for the users to see the accessibility of the application, how personalized the application feels and if they are interested in such an application that personalizes their schedule. In this iteration, we added LLM generated schedules for the user to choose from. We led them through a prototype walkthrough which was centered around gauging whether they could choose between our suggested schedule, personalize their schedule, and achieve their goals.

We collected demographic data of users like their occupation, age, indoor/outdoor preferences, choice of activities. This data was more tilted for us to get a better understanding of how the user wants their day to be scheduled. For example, their occupation will tell us if they have a more sedentary work life or active work life like that of a student. Their age will roughly tell us the intensity of their activities. Their indoor/outdoor preference would gear our recommendation of activities accordingly.

For this survey we chose 3 male users and 3 female users, 4 of which were students and 2 were professionals. This data can be prompt engineered as an automated scheduling prompt into ChatGPT to give us two personalized schedules from which the user can choose their preference. Below is an example of the final prompt engineered schedule given by the LLM model.

Build two schedules for a student of age 22 which includes 1 hour of meditation activities (include 2 other suggestions) , 8 hours of sleep and class from 12:30pm - 1:30pm, class from 2pm - 3:15pm, another class from 5pm-6pm . Incorporate lunch break for 30 mins, 45 mins of swimming or other indoor activities(include 2 other suggestions) , 1 hours of leisure time, 3 hours of assignment time and give reasons as to why each schedule is better than the other.

<p>Morning:</p> <ul style="list-style-type: none"> 8:00 am - 9:00 am: Wake up, morning routine, and breakfast <ul style="list-style-type: none"> Reasoning: Allows for a reasonable wake-up time and a calm start to the day. 9:00 am - 10:00 am: Meditation activities <ul style="list-style-type: none"> Suggestions: Deep breathing exercises and mindfulness meditation. 10:00 am - 12:00 pm: Free time/study time <ul style="list-style-type: none"> Reasoning: Provides a block of focused study time before the first class. <p>Afternoon:</p> <ul style="list-style-type: none"> 12:30 pm - 1:30 pm: Class <ul style="list-style-type: none"> Reasoning: Attend the first class of the day. 1:30 pm - 2:00 pm: Lunch break <ul style="list-style-type: none"> Reasoning: A 30-minute lunch break to refuel and rest before afternoon classes. 2:00 pm - 3:15 pm: Class <ul style="list-style-type: none"> Reasoning: Attend the second class of the day. 3:15 pm - 4:00 pm: Leisure time <ul style="list-style-type: none"> Reasoning: A short break to relax and engage in a hobby or activity for personal enjoyment. 4:00 pm - 5:00 pm: Indoor activities (Swimming or alternatives) <ul style="list-style-type: none"> Suggestions: <ul style="list-style-type: none"> Circuit Training: Quick and effective full-body workout. Yoga or Pilates: Promotes flexibility and relaxation. <p>Evening:</p> <ul style="list-style-type: none"> 5:00 pm - 6:00 pm: Class <ul style="list-style-type: none"> Reasoning: Attend the third class of the day. 6:00 pm - 9:00 pm: Assignment/study time <ul style="list-style-type: none"> Reasoning: Dedicated time for focused academic work. 9:00 pm - 10:00 pm: Dinner <ul style="list-style-type: none"> Reasoning: A balanced and nutritious dinner to fuel the body. 10:00 pm - 11:00 pm: Wind down/prepare for bed <ul style="list-style-type: none"> Reasoning: Establish a calming bedtime routine for better sleep quality. 11:00 pm - 7:00 am: Sleep <ul style="list-style-type: none"> Reasoning: Provides a solid 8 hours of sleep. 	<p>Morning:</p> <ul style="list-style-type: none"> 7:00 am - 8:00 am: Wake up, morning routine, and breakfast <ul style="list-style-type: none"> Reasoning: Early wake-up allows for a longer study period before the first class. 8:00 am - 9:00 am: Meditation activities <ul style="list-style-type: none"> Suggestions: Mindfulness meditation and visualization exercises. 9:00 am - 12:00 pm: Assignment/study time <ul style="list-style-type: none"> Reasoning: A longer morning study block to tackle assignments and coursework. <p>Afternoon:</p> <ul style="list-style-type: none"> 12:30 pm - 1:30 pm: Class <ul style="list-style-type: none"> Reasoning: Attend the first class of the day. 1:30 pm - 2:00 pm: Lunch break <ul style="list-style-type: none"> Reasoning: A 30-minute break to recharge before the afternoon. 2:00 pm - 3:15 pm: Class <ul style="list-style-type: none"> Reasoning: Attend the second class of the day. 3:15 pm - 4:00 pm: Indoor activities (Swimming or alternatives) <ul style="list-style-type: none"> Suggestions: <ul style="list-style-type: none"> Yoga or Pilates: Combines physical activity with relaxation. Bodyweight Exercises: Quick and effective for strength training. <p>Evening:</p> <ul style="list-style-type: none"> 4:00 pm - 5:00 pm: Leisure time <ul style="list-style-type: none"> Reasoning: A short break to unwind and relax. 5:00 pm - 6:00 pm: Class <ul style="list-style-type: none"> Reasoning: Attend the third class of the day. 6:00 pm - 9:00 pm: Assignment/study time <ul style="list-style-type: none"> Reasoning: Another block of focused academic work in the evening. 9:00 pm - 10:00 pm: Dinner <ul style="list-style-type: none"> Reasoning: A balanced and nutritious dinner to fuel the body. 10:00 pm - 11:00 pm: Wind down/prepare for bed <ul style="list-style-type: none"> Reasoning: Establish a calming bedtime routine for better sleep quality. 11:00 pm - 7:00 am: Sleep <ul style="list-style-type: none"> Reasoning: Provides a solid 8 hours of sleep.
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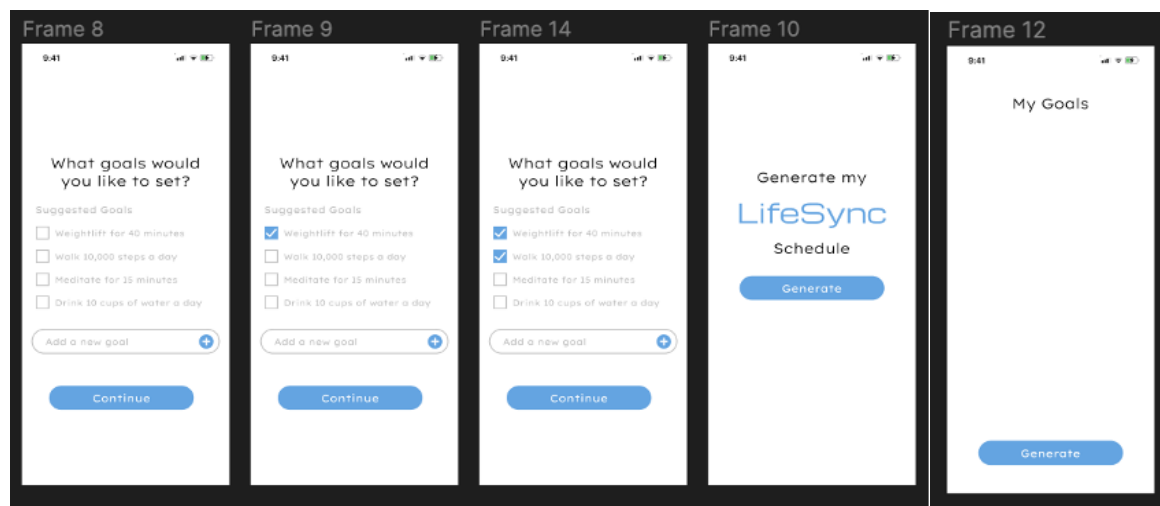
Fig 2 & 3. A snippet of the schedule generated by ChatGPT based on the prompt provided

Based on the two LLM generated schedules shown previously, reasoning was generated to provide users with information as to why each schedule would be beneficial:

Balanced Approach (Schedule 1): This schedule offers a balanced distribution of study, classes, leisure, and self-care activities throughout the day, providing a good mix of focus and relaxation.

Intensive Study Focus (Schedule 2): This schedule prioritizes longer study periods in the morning, making it suitable for individuals who prefer concentrated study sessions and have more flexibility in the afternoon.

The user with these demographics chose the more balanced schedule as they were more comfortable with spaced out events through the day. For most users that were students, a balanced approach was more preferred than a heavy morning suggestion. For users that were professionals, most of them preferred a heavy work block in the day and personal time towards the evening.



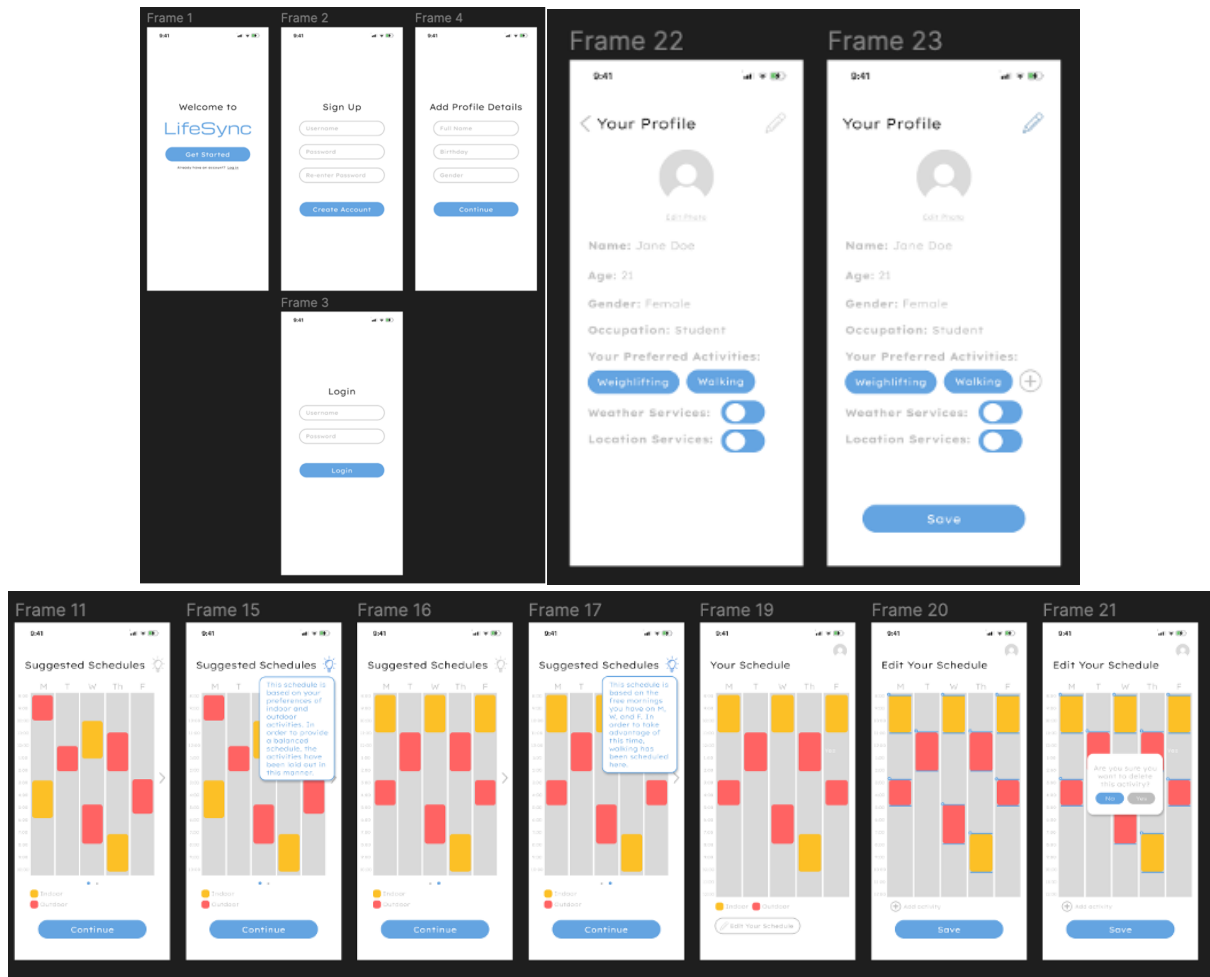


Fig 4.Screenshots of high fidelity prototypes showing features

6.

RESULT

Analyzing the results for the impact of LLM based scheduling of wellness goals, we observed that the users who followed and selected one of the suggested schedules were able to accomplish more tasks in the day and also progress much faster than the ones who modified the suggested schedule. For instance, the graph for User 3 who accepted the schedule and followed the schedule was able to accomplish tasks and work towards the goal they had towards becoming physically fit and being able to increase their stamina to swim for an hour. On the other hand, User 2 made modifications like scheduling the activities one after the other instead of the suggested schedule of spreading out the activities, was only able to progress toward the goals by 40% for the week. This is a strong indicator that the LLM powered along with creating personalized schedules, the automated scheduling is able to help users achieve better results and more balanced schedules.

	Accepted Suggestion 1	Modified Suggestion 1	Accepted Suggestion 2	Modified Suggestion 2	Accepted Suggestion 3	Modified Suggestion 3
User 1	Yes					
User 2				Yes		
User 3			Yes			
User 4		Yes				
User 5					Yes	
User 6			Yes			
Count	1	1	2	1	1	0

Figure 5: Table of results showing how many users choose the accepted suggestion

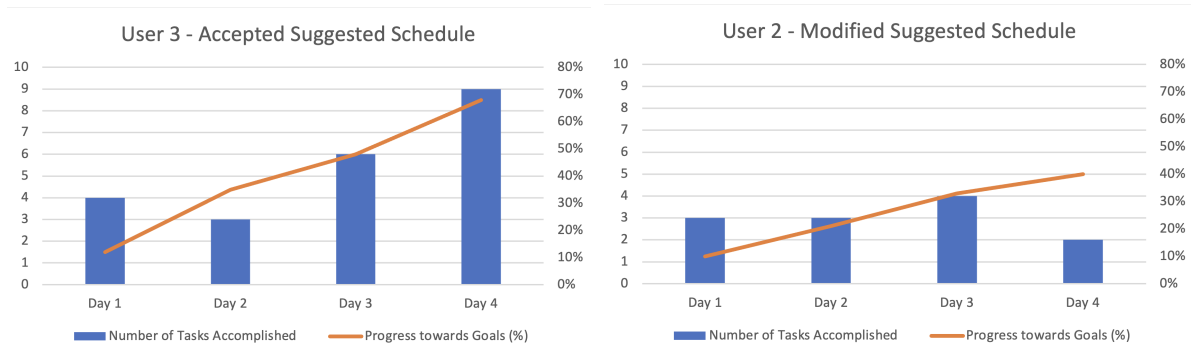


Figure 6 : (left) User 3 result analysis showing the trend of user who used the accepted schedule and (right) User 2 result analysis showing trend of a user who modified the suggested schedule

The users who accepted the suggested schedules chose the schedules that had a balance of the different kinds of activities in their day. Users preferred to do incremental and more iterations of a task rather than doing a big chunk of the task at once. The reasoning that the users received via the insight icon (“bulb icon” on the top right) on the potential schedules that they could choose from, made it easier for them to understand the reasoning behind it. The users like insights that mentioned how the suggested schedule will help them achieve their goals as well as schedules that were catered towards their personal preferences like working out or doing wellness activities in the morning over in the evening. Insights like these were helpful and enabled the user to choose the same over the others.

LLM generated suggestive results + active reflection

User 2: “I like that I can see the reasoning of the specific schedule generated by the application. It was able to generate the result keeping in mind that I like to do workouts in the morning time”

When shown the generated schedule to the user, our application gives reasoning for each schedule that it generates. This is assisted active reflection on the users part to realize what their goals are for the particular day. Some schedules can be balanced while some can be more work heavy in the mornings and cater to different users.

Trust based and privacy based data sharing

User 6: “I am able to trust the application as I am able to allow or not allow the sync to my calendar, also the option to give location access is possible to be updated. This is important for me as I like to be control of the data I share online and in mobile applications”

While still in the nascent stage, our application does give the choice of location sharing and privacy sharing to the user which comes from inbuilt calendar applications we have linked to. Our LLM generation is also independent of the users personal details and focused only on preferences or choices. It builds trust within the human AI community and also serves well in the data privacy domain

7. DISCUSSION

7.1 Findings Contribution to Existing Literature

The findings of the helpfulness of the LifeSync application were able to solve the issue that people face in being able to incorporate well-being activities into their daily schedules. The application used the learning found via research and overcame shortfalls of the existing applications.

Encouraging users to take care of their mental and physical well-being by motivating them to achieve wellbeing goals. This is similar to the need of focusing on wellness [1]. Also, we are able to help the users to perform well, like the similarity with the paper [2] focusing on improved performance with good physical activities.

It gives the ability to schedule the wellbeing activities in the existing Calendar - thereby giving users the ability to automate scheduling in their existing schedules and not forcing users to choose wellbeing over work. This overcomes the shortcoming of the existing applications like Happify discussed in the related work / existing application. We are able to automate the process of scheduling the suggested activities, allowing users to add their own activities , work towards goals and personalization.

7.2 Design Implications & Recommendations

7.2.1 Always Allow Customization

Through our evaluation the main pain point was that every person liked some part of the recommendation and would also like to input their suggestions. The users found the 'bulb' icon on our application to be informative and useful. By clicking on the icon, they were able to get insights on why the application suggested a particular schedule. Additionally, the feature to customize was used the most. The users want to add a bit of personalization on their own as well. They liked that they were not only relying on 'technology' to schedule their day but could also add their 'human' touch. As a design feature giving the users the ability to customize is useful and increases engagement with the application.

7.2.2 Give Insights and Reasonings

On interviewing users on what they like in our application, we found that they like to see the progress they are making towards their goal. 2 of the users shared that the progress towards their goals also motivates them to keep achieving and completing the well-being tasks in their schedule. The design implication of the visualization through the 'Donut Chart' we saw an increased sense of motivation for the users to be able to achieve their well-being goals. The sense of accomplishments the users feel on completing the 'goal donut' motivates them to keep on doing more activities and in turn take care of their wellbeing. As a recommendation, using charts to represent the goals or tasks being completed by users over numbers and percentages on the application is a good way of keeping the user motivated and engaged in using the application.

7.2.3 Less Clutter and Minimalist Design

We made use of swipes instead of buttons, notifications as nudges. In the user evaluation of the application, many users showed a seamless interaction with the use of swiping feature between the suggested schedules. Navigation in the application for similar content - like the different generated schedules made it a seamless process to go from one schedule to another. In order to remind the users of the goals, the users when had nudges on their lockscreen, found it to be useful to be reminded. Making the Design Choice of nudges over sounds or pop-ups in the application made it more user friendly. The users by using other applications in the market have adapted to receive important updates via nudges. And this helped them for a low learning curve in using our application.

8. CONCLUSION

LifeSync, was a project our team embarked on here at the Georgia Institute of Technology. Our goal was to create an application that was revolutionary and different from other wellness-based scheduling applications in the current market. Our research and development of the app has been centered around the creation of a tool that seamlessly blends daily routines with personal well-being goals. Through extensive user research, design iterations, and testing, we have developed an application that addresses the unique challenges and requirements of our users.

Our mission with this app was to have LifeSync leverage large language models (LLMs) such as ChatGPT in order to intelligently automate the scheduling process. This in return would significantly reduce the cognitive load on users. What make this feature the core feature of the app was that it would incorporate often-neglected wellness activities into daily schedules. We found that a standout aspect of LifeSync was its 'bulb' icon feature, which provided insightful feedback and justifications for the suggested schedules, offering a balance between automated suggestions and personal customization.

Our research has shown that users who adhere to the LLM-generated schedules achieve a more harmonious balance in their daily routines, enhancing both productivity and well-being. This underscores the application's effectiveness in integrating wellness activities into busy lifestyles. The design of LifeSync is minimalist and intuitive, which enhances user engagement through its aesthetically pleasing interface and easy navigation. To conclude our semester long research we have developed LifeSync to be a significant advancement in scheduling applications. Our app bridges the gap between task management and personal wellness. The positive feedback and results from our user studies affirm the potential of LifeSync to make a meaningful impact on daily life, promoting wellness as an integrated and achievable goal. Looking ahead, we envision LifeSync evolving with additional features and catering to a broader user base, fostering a more balanced, productive, and well functioning society.

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